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On the equilibrium problem of a soft network shell in the presence of several point loads

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Abstract

We consider a spatial equilibrium problem of a soft network shell in the presence of several external point loads concentrated at some pairwise distinct points. A generalized statement of the problem is formulated in the form of integral identity. Then we introduce an auxiliary problem with the right-hand side given by the delta function. For the auxiliary problem we are able to find the solution in an explicit form. Due to this, the generalized statement of the problem under consideration is reduced to finding the solution of the operator equation. We establish the properties of the operator of this equation (boundedness, continuity, monotonicity, and coercitivity), which makes it possible to apply known general results from the theory of monotone operatorsfor the proof of the existence theorem. It is proved that the set of solutions of the generalized problem is non-empty, convex, and closed. © (2013) Trans Tech Publications, Switzerland.

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Keywords

Equilibrium problem, Existence theorem, Mathematical simulation, Point load, Soft network shell